



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,284	04/14/2005	Toshiki Kishimoto	050128	5061
23850 7590 02/11/2008 KRATZ, QUINTOS & HANSON, LLP 1420 K Street, N.W. Suite 400 WASHINGTON, DC 20005				
EXAMINER				
FINEMAN, LEE A				
ART UNIT		PAPER NUMBER		
2872				
MAIL DATE		DELIVERY MODE		
02/11/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/531,284

**Applicant(s)**

KISHIMOTO ET AL.

**Examiner**

LEE FINEMAN

**Art Unit**

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 9-16 is/are pending in the application.
- 4a) Of the above claim(s) 1, 3-6, 9, 10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2, 11 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2005 & 11/13/07 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is in response to the remarks filed 13 November 2007. Claims 1-6 and 9-16 are pending of which claims 1, 3-6, 9, 10 and 12 are withdrawn.

#### ***Drawings***

1. Replacement drawings for figs. 2 and 4 were received on 13 November 2007. These drawings are acceptable.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 11, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al., US 5,808,793 (henceforth Chang) in view of Trotter, Jr., US 2002/0154403 A1 (henceforth Trotter).

Chang discloses in figs. 4 and 5 a broadband semidouble-type optical isolator characterized by being constituted chiefly of a substrate (59) for placing thereon an optical isolator (56); a one-sheet glass polarizer (49b) disposed on the substrate; a pair of magnetic optical elements (49a and 45a; 49c and 45b) which are each constituted of i) a Faraday rotator (45a, 45b) on each side of which an anti-reflection film has been formed (column 2, lines 49-51) and ii) a polarizer (49a, 49c) which has been formed on one anti-reflection film of the former

(figs. 4 and 5 and column 2, lines 49-51), and are respectively laminated to the glass polarizer (49b) on its inside and outside in such a way that each polarizer (49a and 49c) is provided on the outside (figs. 4 and 5); a magnet which imparts a saturated magnetic field to each Faraday rotator of the magnetic optical elements (see column 4, lines 54-60); and wherein an anti-reflection film has been formed on the surface of the polarizer (column 2, lines 49-51). Chang discloses the claimed invention except for the polarizers (49a and 49c) comprise photonic crystals; wherein said photonic crystals are those obtained by alternately layering transparent high refractive index and low refractive index mediums on rows of periodic grooves or linear projections while keeping the shape of interfaces; wherein said photonic crystals are those obtained by forming periodic grooves by lithography; and wherein the outermost layer of said anti-reflection film on which the polarizer comprising photonic crystals is formed is an  $\text{SiO}_2$  layer. Trotter teaches an optical isolator (36) which includes polarizers (38 and 40) comprising photonic crystals; wherein said photonic crystals are those obtained by alternately layering transparent high refractive index and low refractive index mediums on rows of periodic grooves or linear projections while keeping the shape of interfaces (page 2, paragraph [0021]); wherein said photonic crystals are those obtained by forming periodic grooves by lithography (page 2, paragraph [0020]); and wherein the outermost layer of said anti-reflection film on which the polarizer comprising photonic crystals is formed is an  $\text{SiO}_2$  layer (page 2, paragraph [0021], when  $\text{SiO}_2$  is the outer layer, the antireflective coating will be formed on it). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the polarizers (49a and 49c) of Chang with the photonic crystal polarizers of Trotter to provide a more reliable system in

terms of micro movement of the components which is also less labor intensive (Trotter, page 1, paragraph [0007]).

***Response to Arguments***

4. Applicant's arguments filed 13 November 2007 have been fully considered but they are not persuasive.

Applicant argues "there can be no technical inducement to use this optical isolator [of Trotter], which does not function like an optical isolator, in combination with the broadband, semi-double-type of the Chang patent." The examiner respectfully disagrees. The optical isolator of Trotter clearly isolates specific polarization components while permitting propagation of other selected polarization components (see at least the abstract). Therefore one of ordinary skill in the art would consider Trotter an optical isolator. Further, it is noted, applicant has not defined/claimed any specific isolation characteristics which would prevent Trotter to being considered an optical isolator.

Applicant further argues that one of ordinary skill would naturally be motivated to replace all three polarizers in Chang with the photonic crystal polarizers of Trotter, rather than selectively replacing only two. The examiner respectfully disagrees. As Trotter teaches the use of polarizers comprising photonic crystals in an optical isolator, it could suggest to one of ordinary skill in the art to be able to replace three polarizers in the system as the applicant argues or two polarizers as stated in the rejection or even a single polarizer. Therefore the rejection is still appropriate and maintained.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEE FINEMAN whose telephone number is (571)272-2313. The examiner can normally be reached on Monday - Friday 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on (571) 272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. F./  
Examiner, Art Unit 2872  
28 January 2008

/Stephone B. Allen/  
Supervisory Patent Examiner, Art Unit 2872